



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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August 28, 2014

Keith Lynch
Federal Highway Administration
228 Walnut Street, Room 508
Harrisburg, PA 17101-1720

RE: USFWS Project #2014-0706
PNDI receipt #20140430448964

Dear Mr. Lynch:

This responds to your letter of August 14, 2014, (which we received on August 15, 2014) requesting formal consultation regarding the effects of the proposed Brookhouser Road Bridge (otherwise known as the Saegertown Bridge - State Route (S.R.) 0198) restoration/rehabilitation project on several federally listed endangered or threatened species. The Brookhouser Road Bridge crosses French Creek in Saegertown Borough, Woodcock and Hayfield Townships, Crawford County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) to ensure the protection of endangered and threatened species.

On December 15, 2011, the Fish and Wildlife Service (Service) issued a programmatic biological opinion (PBO) regarding the effects of the Pennsylvania Department of Transportation's (PennDOT) bridge replacement, removal, restoration/rehabilitation, and preservation projects within the Ohio River basin in Pennsylvania (hereafter referred to as Bridge Program). The Service's PBO evaluated the potential effects of PennDOT's bridge program activities on the endangered northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*). The PBO was revised on December 6, 2012, to also consider three recently listed species, the rayed bean (*Villosa fabalis*), snuffbox (*Epioblasma triquetra*), sheepnose (*Plethobasis cyphus*), and amended December 13, 2013 to consider the rabbitsfoot (*Quadrula cylindrica cylindrica*), a federally listed threatened species. In the PBO, we determined that carrying out the Bridge Program during the five year period considered, with full implementation of avoidance, minimization, and conservation measures, as proposed, was not likely to jeopardize the northern riffleshell, clubshell, rayed bean, snuffbox, sheepnose, or rabbitsfoot mussels.

Although the Service provided a PBO for the Bridge Program to the Federal Highway Administration (FHWA) and PennDOT, the Service will review site-specific projects that the project proponents determine "may affect" federally listed species. The Service will determine if

any adverse effects are likely to occur as a result of a site-specific project in a manner, or to an extent, not evaluated or previously disclosed and considered in the Service's PBO. We consider this site-specific project analysis to be "Tier 2" of the consultation process, with the programmatic consultation (and resulting PBO) constituting the "Tier 1" consultation. Our project-specific (Tier 2) consultations will focus on: 1) compliance with the reasonable and prudent measures and associated terms and conditions in the PBO; 2) consistency with the scope and effects previously analyzed in that opinion; 3) project-specific incidental take versus take estimated in the PBO; and 4) any project-specific reasonable and prudent measures and associated terms and conditions that may further reduce the likelihood or quantity of take. If implementation of the measures outlined in the PBO can avoid the take of listed mussels, such that the Service can determine that a project is not likely to adversely affect listed species, no further evaluation by the Service is necessary, and section 7(a)(2) consultation will be considered complete for that project with documentation provided via our written concurrence.

We reviewed the information provided in the "Tier 2" biological assessment entitled, *Washington Crossing S.R. 0062 B08, Pier 2 and 3 Scour Project Over French Creek, Venango County, Pennsylvania*, which describes the potential effects of the proposed bridge scour protection repair project on federally listed species. The proposed project type (*i.e.*, restoration/rehabilitation project) includes a novel causeway and cofferdam design but the anticipated effects are comparable to those discussed and evaluated in the Bridge Program biological assessment and PBO. Therefore, this consultation qualifies as a "Tier 2" consultation under the Bridge Program PBO (Tier 1) consultation.

FHWA's request for formal consultation did not include a request to conference regarding proposed rabbitsfoot critical habitat; however, this was considered in the BA with the determination that the project *may affect and is likely to adversely affect but is not likely to destroy or adversely modify proposed rabbitsfoot critical habitat*. Therefore, this document also includes the Service's conference opinion on the effects of the Washington Crossing Bridge project on proposed critical habitat for the rabbitsfoot mussel. As the PBO did not consider the effects of the Bridge Program on critical habitat, those effects are considered in this project-specific conference opinion.

FHWA and PennDOT Effect Determinations

The project area was surveyed for presence of federal and state listed endangered or threatened freshwater mussels in June of 2010. The survey results indicated that a substantial mussel assemblage (12 species) is present, despite the marginal mussel habitat found. The federal and state endangered northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*) and rayed bean (*Villosa fabalis*) were detected. The snuffbox (*Epioblasma triquetra*) and rabbitsfoot (*Quadrula cylindrica cylindrica*) were not detected during the survey.

Based on the results of a June 2010 freshwater mussel survey and the anticipated direct and indirect disturbance in identified mussel habitat, FHWA determined that scour protection repair project as proposed at the Washington Crossing Bridge *may affect, and is likely to adversely affect* northern riffleshell, and rayed bean pearly mussels. Although not detected during the mussel survey in the project action area, FHWA determined that the project *may affect, and is likely to adversely affect* clubshell, snuffbox, and rabbitsfoot mussels. Based on the best

available commercial and scientific information that demonstrates the presence of these species upstream and downstream of the action area, in locations with a comparable mussel community, we agree that these three species may be present in the action area, albeit at population densities below detection of the survey method and survey effort extended in June 2010. Therefore, we concur with the above effect determinations.

The following Tier 2 biological opinion and conference report (Tier 2 BO) considers the effect of the Washington Crossing Bridge Project on northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot and on proposed rabbitsfoot critical habitat. Specific activities considered involve 1) installation and removal of three water-filled bladders (water-filled cofferdams) as a water diversion measure instead of traditional cofferdams; 2) dewatering the area around Piers 2 and 3; 3) excavating substrate materials near the piers (six feet wide and six feet deep); 4) backfilling the excavation site with concrete and the concrete curing process; 5) access to the work sites (including access points and staging areas); 6) disposal of the excavated materials; and 7) implementing avoidance and minimization measures, as described in the Tier 2 BA. We also consider a mussel salvage that is proposed to minimize the number of federally listed species killed during bridge repair activities. This Tier 2 BO evaluates whether the project, as now proposed, is consistent with PBO and, assuming that this is the case, estimates the incidental take anticipated due to implementation of the Washington Crossing Bridge scour protection repair project and the cumulative total incidental take due to the Bridge Program implementation.

FHWA and PennDOT Effect Determination for Proposed Critical Habitat

The project action area is within proposed critical habitat for the rabbitsfoot mussel. Under Section 7(a)(4) of the Act and the associated Fish and Wildlife Service regulations, Federal agencies may confer with the Service on actions that “may affect” proposed critical habitat. Federal agencies are required to confer with the Service on actions that are “likely to destroy or adversely modify proposed critical habitat”. When critical habitat is listed, Federal agencies must consult with the Service on any action they authorize, fund, or carry out if those actions “may affect” designated critical habitat. In the project biological assessment (page 25 and 27), PennDOT and, as noted above, FHWA determined that the proposed project may affect proposed rabbitsfoot critical habitat but that it is not likely to destroy or adversely modify critical habitat because the actions are largely temporary and comparatively small in scale.

Description of the Proposed Action

The Washington Crossing Bridge is located at about 1000 feet (0.2 miles) upstream from the French Creek confluence with the Allegheny River, and about 0.68 miles downstream from State Route 322 in the City of Franklin, Venango County, Pennsylvania. The existing bridge is a five-span I-beam bridge, with an overall length of 554 feet. It carries four lanes of traffic over French Creek, and has a cantilevered sidewalk attached to the southern side of the structure. Recent bridge inspections document extensive scouring of the river bottom around piers 2 and 3 of the bridge. PennDOT proposes to fill the scour holes at the base of the piers to protect the structural integrity of the bridge. The repair method proposed is to reconstruct an existing access road (laydown and staging area on right-descending bank (western shoreline)), dewater the area

around the piers, install erosion and sedimentation controls (*e.g.*, geo-fabric filter bag on the west side of French Creek), excavate the streambed around the pier (six feet from the face of the pier and six feet below the top of the pier footing), install concrete fill and reuse excavated streambed materials, and dispose of the excess excavated materials (Figure 1).

PennDOT proposes to use water-filled bladder cofferdams to provide access to the Pier 2 and 3 for diversion and dewatering of the worksite. The intent is to minimize duration of the instream project, and minimize the number of endangered mussels killed or injured and avoid long-term adverse effects to stream substrates that may be imposed with the use of traditional rock cofferdams. Construction access will be made from both sides of French Creek, as well as from the bridge deck. A temporary (in place 2 days or less) water-filled bladder will also be used to divert higher water velocity around Pier 3 while the larger cofferdam is installed around this pier (Figure 2). The area inside the cofferdams surrounding both piers will be dewatered by pumping water to a geotextile filter bag sited on river right (western bank). Effectiveness will be monitored post-construction to assess the utility of water-filled bladders at reducing the number of endangered mussels killed or injured compared to traditional cofferdam and causeway structures.

Equipment necessary to complete the work will be lowered from the bridge deck using a crane. Excavated materials will also be lifted from the work area to the bridge by crane and transported for off-site disposal. The excavated area will be backfilled with concrete (pumped down from the bridge deck), and some of the excavated streambed material will be imbedded into the wet concrete. The work will remain “in the dry” until the concrete has cured, then the water-filled cofferdam will be removed. FHWA and PennDOT propose to conduct continuous and spot-check (via hand held meter) in-stream monitoring of pH during the concrete curing process (about three days) (Tier 2 BA, Page 11, and Revised Tier 2 BA, Appendix D, Page 1) to document any unintentional releases of high pH water outside of the contained work area. If there are elevated pH levels that would indicate a potential problem, contractors will be notified and corrective action taken (Revised Tier 2 BA, Appendix D, Page 2). Anticipated duration of the instream disturbance is about one month with a planned start date in August 2015 (a typically low stream flow period).

In summary, the proposed area of direct streambed disturbance in endangered and threatened mussel habitat is around the two piers needing proposed repair, and beneath the temporary water-filled bladder cofferdam and stream diversion system: an area of approximately 29,988 ft² (2,786 m²).

Consistent with the Programmatic bridge consultation, best management practices are proposed as part of the project design (Tier 2 BA, Pages 15 thru 21). These measures are necessary to reduce the amount of take. The Best Management Practices and Conservation Measures checklist in the Tier 2 BA amendment was revised as an amendment to the Tier 2 BA (per FHWA email of August 11, 2014). It provides clarifying notes where necessary, includes measures that are occurring as part of this project. This information is hereby incorporated by reference.

The action area is defined in 50 CFR 402.02 to mean "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area identified by the project proponents for the construction of the Washington Crossing Bridge project extends 90 meters (295 feet) upstream and 150 meters (492 feet) downstream of the existing bridge (Tier 2 BA, Page 22). Because the action area is based on the area affected by the project (*i.e.*, is not restricted solely to the area of anticipated adverse effects), we extend the action area to include the length of the western side channel and French Creek to the mouth of the western side channel (downstream from the bridge to 180 meters (591 feet)). The cofferdams are likely to create a backwater in French Creek that may temporally divert stream flow to the back channel, especially during any increased stream discharge events.

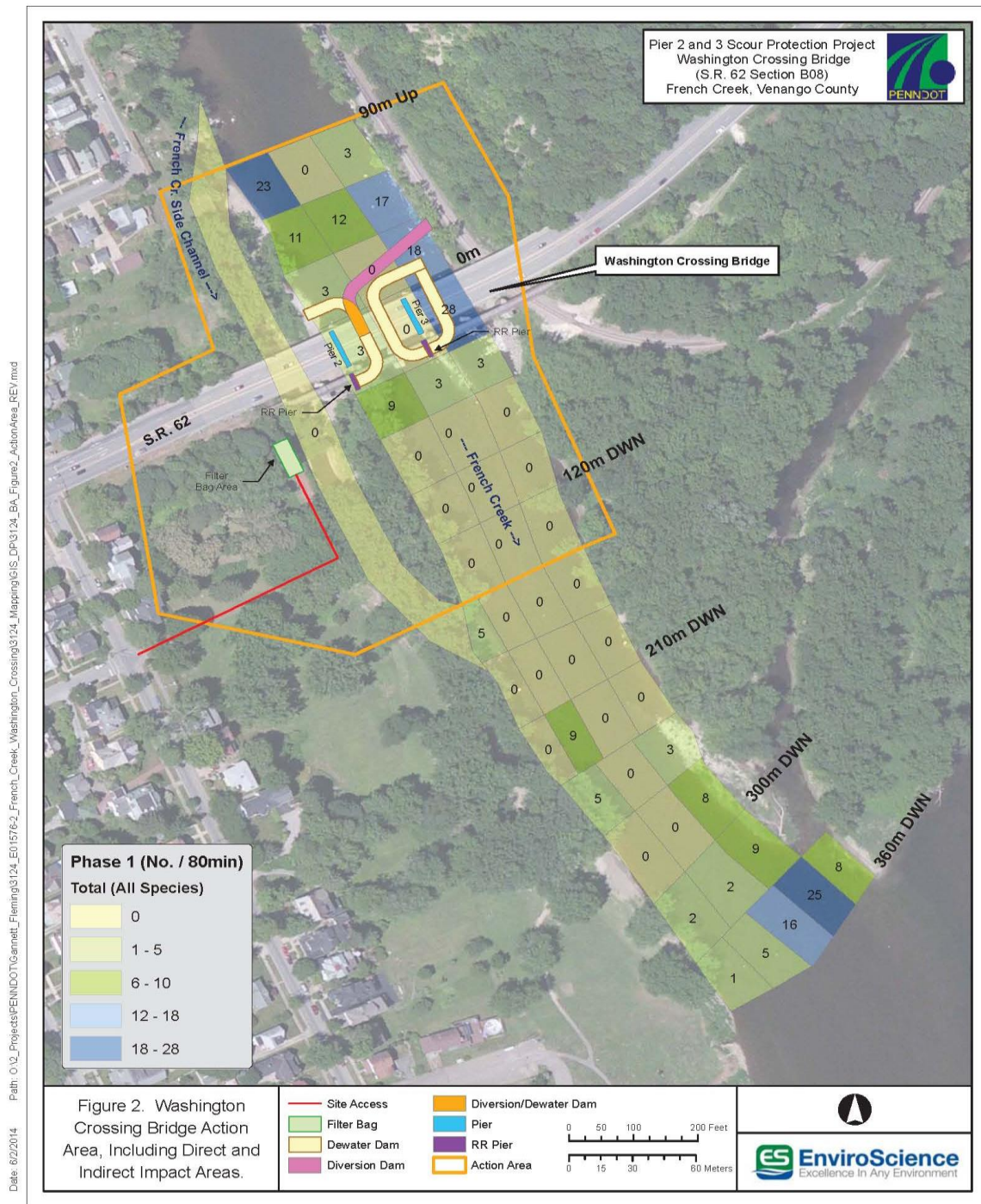


Figure 1. Project action area, mussel survey area and number of species detected. Note that the action area encompassing areas of anticipated direct and indirect effects. The “0” recorded in many search cells may indicate that either no mussels were detected, or a lack of data because the cell was not searched. (Adapted from Figure 2, the Tier 2 BA, Federal Highways Administration, 2014) .

Conservation Measures

Conservation measures represent actions pledged in the project description that the action agency or the applicant will implement to further the species' recovery. Such measures may be tasks recommended in the species' recovery plan, should be closely related to the action, and should be achievable within the authority of the action agency or applicant. The beneficial effects of conservation measures are taken into consideration in the Service's conclusion of jeopardy or non-jeopardy to the listed species, and in the analysis of incidental take. Such measures, however, must minimize adverse effects to listed species within the action area in order to be factored into the Service's analyses.

The following conservation measures have been incorporated into the project description for the Washington Crossing Bridge Project. These measures are designed specifically to avoid and minimize adverse effects of the proposed action on endangered mussels. The Service has analyzed the effects of the proposed action based on the assumption that all conservation measures will be implemented. More detailed descriptions of the conservation measures are provided in the Amended Tier 2 BA checklist (Pages 15 thru 21) (provided via FHWA email of August 11, 2014).

Off-site Measures:

A mussel salvage operation of the direct disturbance areas will be completed prior to construction. This salvage effort includes a one meter buffer to encompass the area that endangered mussel will most likely be killed or injured. Salvaged mussels will be relocated to the Elk River at Queen Shoals, West Virginia or an alternative appropriate site, per an approved mussel salvage plan consistent with the species recovery plan objective 4.22. Project proponents have committed to one monitoring event about three years following the mussel translocation to determine the health and status of the translocated mussels (Tier 2 BA, Page 10).

On-site Measures:

FHWA and PennDOT suggest that the water filled cofferdams will incur less damage on the mussel population than traditional cofferdam designs. A post-construction monitoring event is proposed to establish if there is a conservation benefit to the alternate design.

Status of the Species

Species description, life history, population dynamics, status, and distribution are fully described for the northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot mussels in the revised December 13, 2013, Mussel Programmatic Biological Opinion (PBO, amended) on pages 27 to 38. This information is hereby incorporated by reference. Since issuance of the Service's Tier 1 PBO, there are no substantial changes in the status of the northern riffleshell, rayed bean, clubshell, snuffbox, or rabbitsfoot mussels.

Status of Proposed Critical Habitat

Critical habitat was proposed for the rabbitsfoot in the October 16, 2012, *Federal Register*. Overall, the Service proposed 2,664 river kilometers (1,655 river miles) in 12 states,

including Alabama, Arkansas, Illinois, Indiana, Kansas, Kentucky, Mississippi, Missouri, Ohio, Oklahoma, Pennsylvania, and Tennessee. In Pennsylvania, the Service identified 133 river miles of proposed critical habitat in Crawford, Erie, Mercer and Venango counties as essential to the conservation of the rabbitsfoot mussel. Areas of proposed critical habitat in Pennsylvania include portions of the Allegheny River, French Creek, and the Shenango River. No critical habitat is proposed that is not known to be occupied by the species. The comment period on the proposed rule was re-opened for public comment in the August 27, 2013, *Federal Register*, and again in the May 14, 2014, *Federal Register*.

Primary constituent elements (PCEs) are the physical or biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. PCE components include features such as space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; and sites for breeding, reproduction, or rearing. In order to be considered critical habitat, an area must have all or most of the PCEs present, with the absent PCEs being readily developable. With respect to rabbitsfoot critical habitat, the PCEs include:

- 1) Geomorphically stable stream channel and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support a diversity of freshwater mussels and native fish (*e.g.*, stable riffles, sometimes with runs, and mid-channel island habitats that provide flow refuges consisting of gravel and sand substrates with low to moderate amounts of fine sediment and attached filamentous algae).
- 2) A hydrologic flow regime (the severity, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where rabbitsfoot are found and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for maintenance of rabbitsfoot and host fish habitat, food availability, spawning habitat for native fishes, and the ability for newly transformed juveniles to settle and become established in their habitats.
- 3) Water and sediment quality (including, but not limited to, conductivity, hardness, turbidity, temperature, pH, ammonia, heavy metals, and chemical constituents) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.
- 4) The presence and abundance of fish hosts (currently unknown) necessary for recruitment of the rabbitsfoot. The occurrence of natural fish assemblages, reflected by fish species richness, relative abundance, and community composition, for each inhabited river or creek will serve as an indication of appropriate presence and abundance of fish hosts until appropriate host fish can be identified.
- 5) Either no competitive or predaceous invasive (nonnative) species or such species in quantities low enough to have minimal effect on survival of freshwater mussels.

Environmental Baseline

The Environmental Baseline for the Bridge Program action area is described on pages 38 to 39 of the Tier 1 PBO (amended), and is hereby incorporated by reference. Since issuance of the Service's PBO, several bridge projects have been initiated in the program action area that have resulted in take (see Appendix A). To date, only the Carlton Bridge replacement has proceeded, resulting in incidental take of northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot.

French Creek flows through Franklin and empties into the Allegheny River. It contains more than 80 species of fish and 26 species of mussel, and is among the most biologically diverse streams in the northeastern United States. Although French Creek contains outstanding water quality and rich biodiversity, environmental concerns include chlorine and ammonia discharges (from industrial waste water), farm and highway runoff, failing septic systems, erosion, and sedimentation. However, improvements to sewage treatment plants in Meadville, Cambridge Springs, and Saegertown have helped reduce the amount of chlorine and other chemicals entering the waterway.

Factors Affecting the Species' Environment at the Washington Crossing Bridge

The Washington Crossing Bridge spans French Creek near the confluence of French Creek and the Allegheny Rivers in the City of Franklin, in Venango County. Franklin sits among rolling hills and in a generally rural setting. Other land uses in the project vicinity are a mix of rural wooded land, private dwellings, commercial businesses, riverside industry, recreation, and French Creek Riverfront Park. A rail line runs along French Creek on the left-descending bank and crosses French Creek just downstream of the Washington Crossing Bridge. Riparian buffer areas are contiguous, but narrow throughout this reach of river.

Status of the Species within the action area

A freshwater mussel survey was completed between June 1 to 5, 2010, and June 14 to 17, 2010, encompassing French Creek in portions of the stream between 90 meters upstream from the bridge to 360 meters downstream of the bridge (including the small side channel on the western side of the creek). The survey methodology followed a two phase approach with a qualitative (Phase 1) search of 29 - 20 m by 30 m cells searched for 1.3 person-hours per cell, for a total search effort of 37.7 person-hours. This was followed by a quantitative survey (Phase 2) of 0.25 m quadrats to estimate search efficiency. Water velocity constrained the actual study area searched, and additional Phase 1 cells planned could not be included in the Phase 1 survey (Figure 1) from approximately 60 meters downstream of the bridge to 240 meters downstream.

Phase 2 surveys were within the anticipated area of direct streambed disturbance (30 meters up- and 60 meters downstream of the bridge) but limited, due to high water velocity mid-channel, to two areas; 76 - 0.25 m² quadrats were surveyed along the left-descending side of the channel and 98 - 0.25 m² quadrats positioned in the western back channel. A third Phase 2 location was surveyed near the confluence with French Creek, which is outside of the action area based on the effects of the project as proposed. The Phase 2 sampling quadrat were visually searched and then all materials within the quadrats were excavated (to 10 – 15 cm), inspected for remaining

mussels, and processed stream-side. Because all visual surveys were not first conducted on the survey quadrats, as described in the survey report (EnviroScience, 2011. Page 4), this technique cannot be used for accurately estimating the search efficiency.

Habitat was reported to range from shallow water with large slabs of flat rock, boulders, cobbles and sand gravel (upstream of the bridge) to swifter velocity water (increased slope) containing boulders, and construction debris that was swept clean of smaller substrate materials necessary for adequate mussel habitat. Aquatic vegetation was missing in the direct disturbance area, but limited *Vallesneria* sp. could be found in quieter waters. As French creek approached the Allegheny River, substantial sand and gravel deposits were evident on the left descending bank toward mid-stream.

In total, 347 mussels representing 12 species were found during the survey. No additional species were represented only by dead shells. The project area was found to contain significant freshwater mussel resources, including northern riffleshell and rayed bean. Calculated mussel population density for northern riffleshell is $1.7/\text{m}^2$ ($n=19$) in the western back channel and $0.05/\text{m}^2$ for rayed bean ($n=1$) in the main channel (EnviroScience 2011). The most significant mussel population in the project area was located from mid-channel to river left between 330 and 360 meters downstream of the bridge. However, the BA concludes that this mussel population density is not representative of the area that will be directly disturbed, as so few mussels were found in these Phase 1 cells within the direct project area, and approximately 85 percent of the habitat within the main channel immediately surrounding the Washington Crossing Bridge is described as being of marginal quality for mussels (the western back channel was not surveyed in Phase 1 but was reported to be largely suitable as endangered mussel habitat). Through Phase II sampling in the main channel within the anticipated area of direct streambed disturbance, total average mussel density was calculated at northern riffleshell density of $0.025/\text{m}^2$ (EnviroScience 2011). The BA adjusted northern riffleshell density down in various Phase 1 cells because no northern riffleshell were sampled in the quadrats along the right-descending-bank, therefore, it was not possible to make a direct population estimate. Based on an estimated search efficiency of 20 percent and the 29 northern riffleshell found in Phase 1 surveys in the main channel cells searched, the mussel survey estimated an overall population density of northern riffleshell of $0.025/\text{m}^2$ (EnviroScience 2011, Page 9).

The mussel survey was completed prior to and during a relatively high flow period on June 1 to 5 and June 14 to 17, 2010. The stream discharge during sampling (Figure 2) likely limited both the area that could be effectively surveyed and the apparent habitat condition reported. Higher stream discharge rates also reduced efficiency and species detection. Quantitative sample was also restricted to specific and limited locations within the overall survey area. Freshwater mussels typically exhibit a clumped distribution that are sometimes referred to as mussel beds. The survey results demonstrate that at Washingtons Crossing survey mussel habitat and distributions are not homogeneous. The most common species encounter in the Phase 1 survey was northern riffleshell which comprised 43.5 percent of the mussels located, including many along the right-descending-bank in the project area. Although Phase 2 sampling was focused along the right-descending-bank, northern riffleshell was not detected in quantitative searches where a single rayed bean was found a species that in Phase1 sampling represented only 3.2 percent in relative abundance. Although both the mussel survey report and the BA attempt to

extrapolate the 2010 mussel survey data in various ways, the sampling conditions appear to strongly bias the data to habitat along the stream margins. The 2010 survey data demonstrate the presence of northern riffleshell and rayed bean in the action area, and a diversity of other species, but the survey effort does not appear to be adequate to extrapolate abundance across the action area as proposed in the Washingtons Crossing BA.

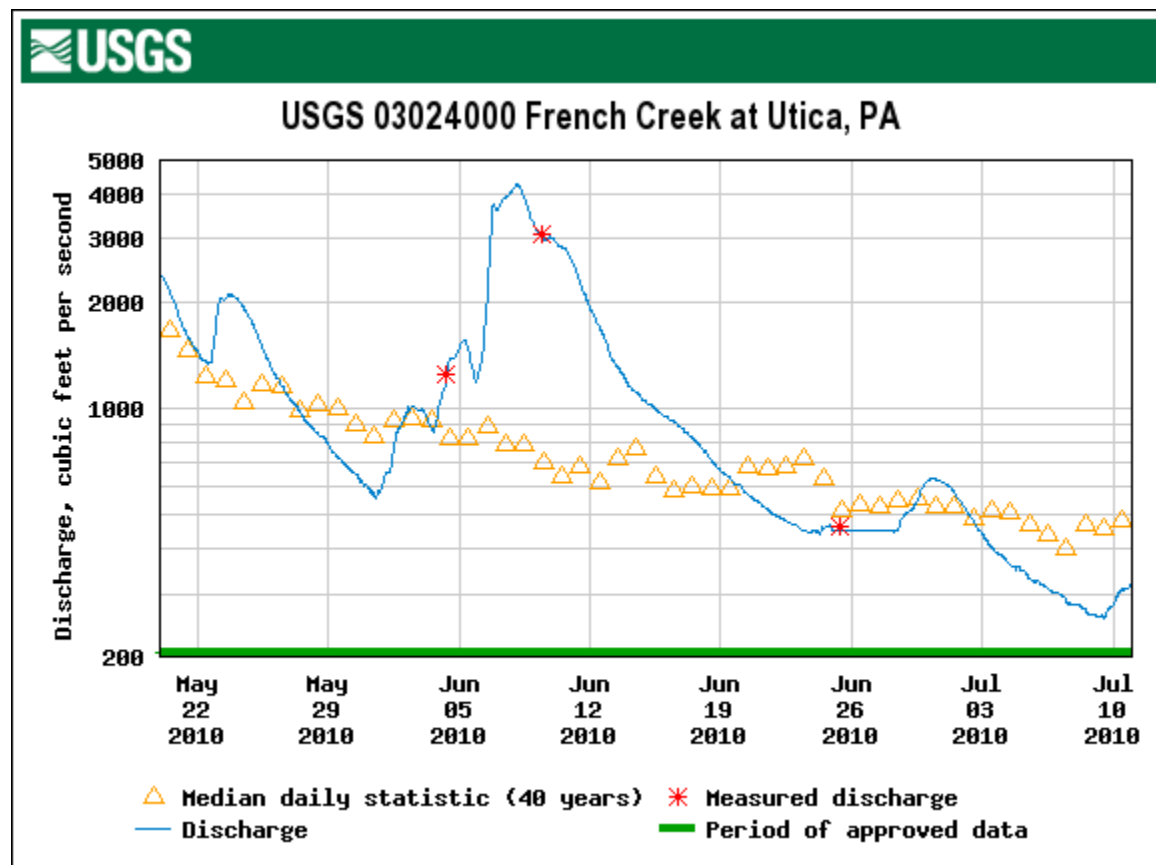


Figure 2. French Creek discharge at Utica, PA between May 20, 2010 and July 10, 2010. The U.S. Geological Survey Gaging Station is approximately 9 miles upstream of the Washingtons Crossing Bridge. The freshwater mussel survey was completed between June 1 to 5, 2010, and June 14 to 17, 2010

As stated above, the clubshell, rabbitsfoot, and snuffbox were not found in the action area. However, these species are known to occur upstream and downstream of the project area (Smith, 2005) and may be present, albeit at population abundances that are below detection using the survey methods and search effort implemented in the 2010 mussel survey.

Status of Proposed Critical Habitat in the Action Area

Proposed critical habitat for rabbitsfoot includes 120.4 river-kilometers (74.8 river-miles) of French Creek from Union City Reservoir Dam northeast of Union City, Erie County, Pennsylvania, downstream to its confluence with the Allegheny River near Franklin, Venango County, Pennsylvania (Unit RF23). This unit was occupied at the time of listing and contains all

or some components of the physical and biological features essential to the conservation of the rabbitsfoot, and contains all five PCEs (USFWS 2012). The presence of a diversity of freshwater mussels in the action area and downstream at the confluence demonstrates that all PCEs may be present at the Washington Crossing Bridge site. The action area is within of proposed critical habitat for rabbitsfoot.

Effects of the Action

Direct effects are caused by or will result from, and occur contemporaneously with, the proposed action. Indirect effects are caused by, or will result from, the proposed action and are later in time, but are still reasonably certain to occur. The effects of the action include the direct and indirect effects on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. These effects are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species [50 CFR §402.02]. Additional descriptive information of the types of effects that typically occur as a result of bridge program projects is provided in the Tier I PBO on pages 50 to 59.

Direct Effects

Based on our analysis of the information provided in the Tier 2 BA, we anticipate that direct adverse effects will result from the Washington Crossing Bridge project when northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot are killed, injured, or harmed (via crushing, smothering, poisoning (due to elevated pH), dislodging, removing, translocation stress, and dewatering) in areas in, or near, direct streambed disturbance. Sources of adverse effects include placement of the water-filled bladders over mussel habitat, dewatering of the work site, removal of substrate and any resulting side-slope failure of substrate disturbed but not physically removed, minor backwater/siltation, scour around the cofferdams, water quality alteration (*e.g.*, elevated pH from freshly poured concrete), and siltation downstream of the project when the cofferdams are drained and removed.

During construction, the stream diversion and cofferdams at the upstream end of the project area and around piers 2 and 3 may result in increases the river stage during higher flows. Localized backwater effects can facilitate silt deposition upstream and streambed scour downstream. Localized scour and redistribution that can occur near the cofferdams may result in substrate movement that mussels are not able to tolerate. The streambed material and any endangered mussels that are dislodged and re-deposited downstream where water velocity decreases, may be smothered when sediments settle out. Those mussels not killed or injured during this process may still be killed or harmed through suffocation, gill clogging, or increased predation as a result of increased exposure if they are unable to right themselves and re-burrow into suitable habitat downstream.

According to the Amended Tier 2 BA (Appendix D, sent via email August 11, 2014), the water-filled diversion and cofferdams will be deflated slowly, in a controlled manner directly into French Creek. As the cofferdams will have been in place for about one month, siltation in the backwater areas may build up. When the water-filled cofferdams are removed the back water

will once again be restored to a free-flowing condition, potentially carrying accumulated silt with it. Further mussel injury or mortality may occur through suffocation or gill-clogging, or mussels stop filtering or abort.

The extent of adverse effects will depend on river flows and silt load in disturbed substrate when the action occurs. Equipment is at risk of flooding or sinking during high flow events if the water-filled cofferdams that protect them are overtopped, unless precautions are taken to avoid this. Further, construction materials and equipment may affect mussels if the equipment is washed into the river and is either physically transported downstream by currents, or if toxic materials, such as fuel or hydraulic fluids, spill into the river. Such spills could directly or indirectly affect endangered mussels, resulting in take. The project proponents have not provided a detailed Pollution Prevention Plan (PPP). Toxic spills can be anticipated if construction equipment (*i.e.* excavator) or work sites are flooded or become compromised. A PPP details strict implementation of siltation and erosion measures, off-site storage of toxic materials, and construction crew education to reduce the risk of accidental or unintended catastrophic events. Although there appears to be a relatively low population density of endangered mussels in the action area, such an event would increase the amount of take and expand the area in which endangered mussels are killed, harmed, or harassed.

High water events when the water-filled cofferdam coffer are in place would substantially increase backwater upstream, which would increase flow in the western back channel. Because northern riffleshells are more abundant in the back channel, increased water volume and velocity will increase the risk of scour throughout the side channel that may dislodge or bury (smother) adult and juvenile northern riffleshell and erode the species habitat, resulting in harm.

As filter feeders on microscopic food items, the northern riffleshell, rayed bean, clubshell, snuffbox and rabbitsfoot are very susceptible to smothering by silt and other sediments in the water. Siltation also may result in reduced dissolved oxygen and increased organic material at the substrate level. At sublethal levels, silt interferes with feeding and metabolism in general. Because the clubshell typically burrows completely beneath the substrate, and rayed bean are small, and tend to occupy habitat along the stream margin or other flow refugia, these species may be particularly susceptible to siltation, which clogs the substrate interstices and suffocates the animal.

Mussels will be smothered, buried, or have their gills clogged from project-related silt and other sediments. The extent of the silt plume will depend upon background silt load during the bridge repair, water velocity, and particle size. Silt plumes during construction and removal of the water-filled cofferdams may extend out of the areas of direct streambed disturbance. The estimated area of incidental take for the Washington Crossing Bridge project extends 90 meters (295 feet) upstream and 150 meters (492 feet) downstream of the existing bridge, to encompass the section of the river and adjacent riverbanks where the anticipated scour protection repair will occur.

Within the silt plume, mortality, injury, or stress to mussels is expected from siltation and other types of sedimentation caused by in-stream construction (*i.e.*, backwater siltation effects from water-filled cofferdam diversions and coffer, and stream adjustments/hydraulic modifications as

the stream establishes equilibrium post-construction), site restoration post-construction (*i.e.*, siltation, water quality effects, and scour when the water-filled cofferdams are removed, and dissemination of the water filling the water-filled cofferdams), and streambank construction (*i.e.*, staging areas, and access road re-construction). Implementation of erosion and sedimentation control practices are critical to minimize these sources of sediment.

Water quality is necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages. As sedentary creatures, mussels may be especially vulnerable to pH increases (from newly poured “green concrete”) and reduced dissolved oxygen (from dispersion of anoxic water from the water-filled cofferdams once work is completed), as they cannot move quickly to refugia and stay out of harm’s way. Mussels may become stressed, injured or killed when degraded water passes over them.

Indirect Effects

Indirect effects resulting from Washington Crossing Bridge project are similar to those described in the PBO and include injury resulting from altered hydrology, siltation and scour as the stream reaches equilibrium after the construction is completed.

Critical Habitat

The proposed project may affect, and is likely to adversely affect the proposed rabbitsfoot critical habitat in the action area during construction, due to the instream water-filled cofferdams, and following construction until the streambed achieves a new equilibrium with the repaired structures. This will likely occur following several bank-full flow events.

The effect of the Bridge Program on proposed rabbitsfoot critical habitat has not been considered in the PBA. The effects of the project in proposed rabbitsfoot critical habitat were assessed by PennDOT and FHWA in the Tier 2 BA and concluded that the project may affect proposed rabbitsfoot critical habitat, and is likely to adversely affect it, but would not likely result in destruction or adverse modification. Adverse Modification is direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical. Our analysis includes assessing how the action affects the primary constituent elements (PCEs) or other pertinent habitat features, and how such effects on the PCEs will affect the survival and recovery of rabbitsfoot. The PCE’s of rabbitsfoot critical habitat are detailed above.

- 1) *Will the proposed action temporarily to permanently alter a geomorphic stability of French Creek in a manner that reduces the habitat function to support a diversity of freshwater mussels and native fish?*

The change of the flow patterns around the existing bridge piers are likely to result in long-term effects, as French Creek flow patterns adjust to the presence of the new sub-structure around each pier base. We anticipate that shifts in habitat locations of suitable habitat will occur, but that streambed will achieve a new equilibrium over time and that

the overall amount and quality of proposed rabbitsfoot critical habitat will then be similar to the existing condition.

- 2) *Will the proposed action temporarily or permanently alter the hydrologic flow regime necessary to maintain (1) benthic habitats where rabbitsfoot are found; (2) connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the mussels' and fish hosts' habitat and food availability; (3) spawning habitat for native fishes; and (4) the ability for newly transformed juveniles to settle and become established in their habitats?*

The water-filled cofferdam installation sites together with the dewatered work site across much of French Creek will result in a temporary alteration of flow in the action area as a consequence of upstream backwater and increased water velocity between the water-filled cofferdam coffer and diversion sections. During the relatively short period of time during which the work platforms will be in place (approximately 2-3 days for the diversion water-filled cofferdam and up to 30 days for the water-filled cofferdam coffers), there will likely be some substrate scouring within several feet of the in-stream water-filled cofferdams during high flows, due to increased water velocities. The material will be deposited downstream when water velocity decreases.

A long-term reduction in habitat quality may occur within the footprint of the work site, in the water-filled cofferdam interior, as the material near the existing piers will be excavated and replaced with concrete. The presence of additional concrete rather than native bed materials within the proposed critical habitat may reduce the quality and availability of habitat post-project. Scouring may also result in subtle changes in area hydrology, as channels are formed in the river bottom, and substrate composition is altered.

- 3) *Will the proposed action degrade water or sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all mussel life stages?*

Habitat degradation in the form of water quality impairment may also occur. There is the potential for elevated water pH, if the proposed concrete installation at the pier bases does not cure properly, or is subjected to high water events before completely curing, though the potential for this will be greatly reduced by doing the work in the dry, and monitoring the pH levels within the action area. Treatment of the water from areas that contains "green concrete" is proposed, but not detailed, in the Tier 2 BA.

Instream areas may be adversely affected by equipment refueling and maintenance activities within the work area, especially if there is an accidental spill. This can be alleviated by preparing and implementing a Pollution Prevention Plan.

Mussels within the action area may be affected by silt and anoxic water, once the water-filled cofferdams are emptied after the 30-day construction period. The quality of the water in the water-filled cofferdams greatly depends upon the water source used to fill

them, the duration of the water within the water-filled cofferdams, temperatures of the contained water, methods used to “deflate” the water-filled cofferdams, and sedimentation and erosion controls used to empty the bags of their water load once construction is completed. Proper implementation of Erosion and sedimentation controls, coupled with slow releases of the contained water (perhaps through filter bags) could minimize some of these effects. However, installation and removal of the water-filled cofferdams have not been detailed in the Tier 2 BA.

- 4) *Will the proposed action preclude presence or reduce abundance of fish hosts (currently unknown) necessary for recruitment of the rabbitsfoot?*

Habitat for fish species that serve as hosts for rabbitsfoot glochidia, could be adversely affected by substrate disturbance (e.g., scouring), increased turbidity, sediment deposition, and introduction of petroleum products into the river. The physical presence of construction activities may modify host fish behavior, travel patterns, or habitat use. These effects are expected to be short-term and localized in extent, and largely limited to the period of instream construction. Like the habitat modification described above, the amount and quality of fish habitat is likely to return as the stream channel shifts in response to the presence of the new structure.

- 5) *Will the proposed action introduce or increase abundance of competitive or predaceous invasive (nonnative) species, to levels that effect the survival of rabbitsfoot?*

In the PBA and Tier 2 BA, PennDOT and FHWA committed to disinfect and inspect all vehicles and equipment for zebra mussels and other potential invasive or exotic species before entering French Creek, and to provide evidence that this has been done following accepted protocols (BA, page 17). We do not anticipate any long-term habitat alteration will occur that would make proposed critical habitat more conducive to invasive species that could reduce the amount or quality of habitat for survival of rabbitsfoot.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions, not involving a Federal action, that are reasonably certain to occur in the action area considered in this biological opinion. Future federal and non-federal actions that are reasonably certain to occur, but are unrelated to the proposed action, are not considered in this section because they require separate consultation under section 7 of the Endangered Species Act. Cumulative effects are described on page 61 of the Tier 1 PBO, and are hereby incorporated by reference.

The Washington Crossing Bridge is in a residential/commercial/industrial area in a rural setting in Franklin Borough. While a variety of activities are likely to occur in such a setting, we are not aware of specific actions that are likely to occur and that would adversely affect the species in the action area, beyond the section 7 action considered in this opinion.

Conclusion

The project design exceeds the level of streambed disturbance considered in the PBO for this bridge. The programmatic Tier 1 biological assessment estimated that, without

avoidance and minimization measures, the Washington Crossing Bridge project would result in a total disturbance area of up to 425m² (4,574.7 ft²). The Tier 2 BA indicated that the total direct disturbance area now proposed (including water-filled cofferdams, diversion structure, and dewatered worksite area) is 2,786 m², greatly exceeding the pre-minimization estimate. Table 6-1 in the Tier 2 BA outlines the proposed disturbance areas by activity type. However, the 2010 survey indicates that mussel populations are sparse in action area; therefore the estimated level of take is similar to that considered in the PBO.

After reviewing the size and scope of the proposed project; the environmental baseline; the overall status of the northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot mussels; the effects of the action; and the cumulative effects, we conclude that the Washington Crossing Road Bridge replacement project *may affect, and is likely to adversely affect* the northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot mussels. The effects of the action will not result in adverse effects that are beyond those that were considered in the Service's PBO for northern riffleshell, and rayed bean mussel species. However, the effects of the action may result in adverse effects beyond that which was considered in the Service's PBO for the snuffbox mussel (only 68 mussels were considered), and clubshell and rabbitsfoot mussels for which no take was estimated in the PBO.

This project has not resulted in a jeopardy determination because: (1) the project-specific level of anticipated take is less than that considered in the PBO for northern riffleshell, rayed bean, and snuffbox; (2) the Federal Highway Administration and PennDOT will implement conservation measures to maintain water quality and minimize adverse effects to mussel habitat; (3) the Federal Highway Administration and PennDOT will implement a mussel salvage to reduce the number of mussels directly killed or injured in the action area; (4) the project design incorporates avoidance and minimization measures that increase the likelihood that endangered mussels will be able to recolonize the area once the project is completed.

The Washington Crossing Bridge project is also likely to adversely affect proposed rabbitsfoot critical habitat during construction, and, for a period of time afterward until a new stream channel equilibrium is established. We anticipate that these changes will be temporary because a comparable area of suitable rabbitsfoot habitat will become reestablished following several high (*e.g.*, bank full) channel-shaping flow events. Therefore, after reviewing the current status of rabbitsfoot, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's conference opinion that the Washington Crossing Bridge replacement project, as proposed, is not likely to destroy or adversely modify proposed critical habitat for rabbitsfoot.

Summary of Effect Determinations

Species	Listing Status	FHWA Effect Determination (FWS concurrence)
<i>Pleurobema clava</i> (clubshell)	Federal and State Endangered	May Effect, Likely to Adversely Affect (FWS concurs)
<i>Epioblasma torulosa rangiana</i> (northern riffleshell)	Federal and State Endangered	May Effect, Likely to Adversely Affect (FWS concurs)
<i>Villosa fabalis</i> (rayed bean)	Federal and State Endangered	May Effect, Likely to Adversely Affect (FWS concurs)
<i>Epioblasma triquetra</i> (snuffbox)	Federal and State Endangered	May Effect, Likely to Adversely Affect (FWS concurs)
<i>Quadrula cylindrica cylindrica</i> (rabbitsfoot)	State Endangered and Federal Threatened, and Proposed Critical Habitat	May Effect, Likely to Adversely Affect (FWS concurs) Critical Habitat: May Affect, Likely to Adversely Affect; not likely to destroy or adversely modify (FWS concurs)

Incidental Take Statement

This “Tier 2” biological opinion is based on potential adverse effects to the northern riffleshell and rayed bean, clubshell, snuffbox and rabbitsfoot (and rabbitsfoot proposed critical habitat) mussels during scour protection repairs of the Washington Crossing Bridge over French Creek. This “Tier 2” BO identifies the incidental take anticipated due to implementation of this Management Unit 1 bridge repair project with the incorporation of measures to minimize take. The cumulative total incidental take resulting from Bridge Program actions to the date of this Tier 2 BO is included in Appendix A.

Construction related to the scour protection repair of the Washington Crossing Bridge will occur between 2014 and 2018, and may result in take of northern riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot mussels. Species distributions and abundance detected during the 2010 mussel survey are not reliable for estimating take due to the patchy distribution of habitat and listed species and marginal sampling conditions when the survey was completed, consistent with the approach taken in the PBO, incidental take of riffleshell, rayed bean, clubshell, snuffbox, and rabbitsfoot is measured indirectly as the area of direct streambed habitat disturbed (m² of area) are based on the estimated population density predicted in the PBO. This take is counted toward the cumulative total incidental take as outlined in the PBO.

Table 1a. Northern riffleshell incidental take estimates for the Washington Crossing Bridge (S.R. 62) Scour Protection Repair Project, Venango County, PA.

Area Within Which Take Will Occur	Type of Take	Estimated mean population density	Number of Northern Riffleshell
Area of directly disturbed mussel habitat: 2,786 m ² . Includes water-filled cofferdam installation – both temporary diversion and coffer (1,490 m ²) dewatering construction site (1,296 m ²).	Northern riffleshell killed, harmed or harassed by crushing smothering, dislodging during construction after an effective (70 percent) salvage effort	2.03 Northern riffleshell/m ²	1,697 ¹
Total incidental take: Area exposed to backwater effects, sedimentation and siltation during construction and water-filled cofferdam removal, scour during and following construction, altered hydrology (90-m upstream, 180-m downstream, 67.5-m wide); 18,225 m ²	Northern riffleshell harmed or harassed during construction and post-construction	0.025 Northern riffleshell/m ²	xx ²
The number of northern riffleshells salvaged assuming a 70 percent efficiency during the mussel salvage	Animals harassed during salvage and relocation	2.03 northern riffleshell/m ²	3,959 ³
Total Incidental Take			

¹ Direct effects: 2,786 m² (direct habitat disturbance) x 2.03 northern riffleshell/m² x 0.3 (70% salvage efficiency) = 21 northern riffleshell (rounded to nearest whole animal)

² 18,225m² x 0.025 northern riffleshell/m² = 456 northern riffleshell (rounded to nearest whole animal)

³ 2,366 m² (direct habitat disturbance total – area for the temporary diversion water-filled cofferdam) x 2.03 northern riffleshell/m² x 0.7 (70 % salvage efficiency) = 41 (rounded to nearest whole animal)

Table 1b. Rayed bean incidental take estimates for the Washington Crossing Bridge (S.R. 62) Scour Protection Repair Project, Venango County, PA.

Area Within Which Take Will Occur	Type of Take	Estimated mean population density	Number of Rayed Bean
Area of directly disturbed mussel habitat 2,786 m ² . Includes water-filled cofferdam installation – both temporary diversion and coffer (1,490 m ²) and dewatering construction site (1,296 m ²).	Rayed bean killed, harmed or harassed by crushing, smothering, dislodging or removal for translocating during construction.	3.24 rayed bean/m ²	2,708 ¹
Total incidental take: Area exposed to backwater effects, sedimentation and siltation during construction and water-filled cofferdam removal, scour during and following construction, altered hydrology (90-m upstream, 180-m downstream, 67.5-m wide); 18,225 m ²	Rayed bean harmed or harassed during construction and post-construction	0.05 rayed bean/m ²	xx ²
The number of rayed bean salvaged assuming a 70 percent efficiency during the mussel salvage	Animals harassed during salvage and relocation	3.24 rayed bean /m ²	6,319 ³
Total Incidental Take			

¹ Direct effects: 2,786 m² (direct habitat disturbance) x 3.24 rayed bean/m² x 0.3 (70% salvage efficiency) = 42 northern riffleshell (rounded to nearest whole animal)

² 18,225m² x 3.24 rayed bean/m² = xx rayed bean (rounded to nearest whole animal)

³ 2,366 m² (direct habitat disturbance total – area for the temporary diversion water-filled cofferdam) x 3.24 rayed bean/m² x 0.7 (70 % salvage efficiency) = xx (rounded to nearest whole animal)

Table 1c. Clubshell incidental take estimates for the Washington Crossing Bridge (S.R. 62) Scour Protection Repair Project, Venango County, PA.

Area Within Which Take Will Occur	Type of Take	Estimated mean population density	Number of Clubshell
Area of directly disturbed mussel habitat 2,786 m ² . Includes water-filled cofferdam installation – both temporary diversion and coffer (1,490 m ²) and dewatering construction site (1,296 m ²).	Clubshell killed, harmed or harassed by crushing smothering, or dislodging during construction.	0.001 clubshell/m ²	1 ¹
Total incidental take: Area exposed to backwater effects, sedimentation and siltation during construction and water-filled cofferdam removal, scour during and following construction, altered hydrology (90-m upstream, 180-m downstream, 67.5-m wide); 18,225 m ²	Clubshell harmed or harassed during construction and post-construction	0.001 clubshell/m ²	xx ²
The number of clubshells salvaged assuming a 70 percent efficiency during the mussel salvage	Animals harassed during salvage and relocation	0.001 clubshell/m ²	2 ³
Total Incidental Take			

¹ Direct effects: 2,786 m² (direct habitat disturbance) x 0.05 clubshell/m² x 0.3 (70% salvage efficiency) = 39 northern riffleshell (rounded to nearest whole animal)

² 18,225m² x 0.003 clubshell/m² = 55 clubshell (rounded to nearest whole animal)

³ 2,366 m² (direct habitat disturbance total – area for the temporary diversion water-filled cofferdam) x 0.050 clubshell/m² x 0.7 (70 % salvage efficiency) = (rounded to nearest whole animal)

Table 1d. Snuffbox incidental take estimates for the Washington Crossing Bridge (S.R. 62) Scour Protection Repair Project, Venango County, PA.

Area Within Which Take Will Occur	Type of Take	Estimated mean population density	Number of Clubshell
Area of directly disturbed mussel habitat 2,786 m ² . Includes water-filled cofferdam installation – both temporary diversion and coffer (1,490 m ²) and dewatering construction site (1,296 m ²).	Snuff box killed, harmed or harassed by crushing smothering, or dislodging during construction.	0.16 snuffbox/m ²	xx ¹
Total incidental take: Area exposed to backwater effects, sedimentation and siltation during construction and water-filled cofferdam removal, scour during and following construction, altered hydrology (90-m upstream, 180-m downstream, 67.5-m wide); 18,225 m ²	Snuffbox harmed or harassed during construction and post-construction	0.16 snuffbox/m ²	xx ²
The number of snuffbox salvaged assuming a 70 percent efficiency during the mussel salvage	Animals harassed during salvage and relocation	0.16 snuffbox/m ²	xx ³
Total Incidental Take			

¹ Direct effects: 2,786 m² (direct habitat disturbance) x 0.05 clubshell/m² x 0.3 (70% salvage efficiency) = 42 snuffbox (rounded to nearest whole animal)

² 18,225m² x 0.003 clubshell/m² = 911 snuffbox (rounded to nearest whole animal)

³ 2,366 m² (direct habitat disturbance total – area for the temporary diversion water-filled cofferdam) x 0.050 clubshell/m² x 0.7 (70 % salvage efficiency) = 83 snuffbox (rounded to nearest whole animal)

Table 1e. Rabbitsfoot incidental take estimates for the Washington Crossing Bridge (S.R. 62) Scour Protection Repair Project, Venango County, PA.

Area Within Which Take Will Occur	Type of Take	Estimated mean population density	Number of Rabbitsfoot
Area of directly disturbed mussel habitat 2,786 m ² . Includes water-filled cofferdam installation – both temporary diversion and coffer (1,490 m ²) and dewatering construction site (1,296 m ²).	Rabbitsfoot killed, harmed or harassed by crushing smothering, or dislodging during construction.	0.055 rabbitsfoot/m ²	45 ¹
Total incidental take: Area exposed to backwater effects, sedimentation and siltation during construction and water-filled cofferdam removal, scour during and following construction, altered hydrology (90-m upstream, 180-m downstream, 67.5-m wide); 18,225 m ²	Rabbitsfoot harmed or harassed during construction and post-construction	0.055 rabbitsfoot/m ²	xx ²
The number of snuffbox salvaged assuming a 70 percent efficiency during the mussel salvage	Animals harassed during salvage and relocation	0.055 rabbitsfoot/m ²	107 ³
Total Incidental Take			

¹ Direct effects: 2,786 m² (direct habitat disturbance) x 0.05 clubshell/m² x 0.3 (70% salvage efficiency) = 42 rabbitsfoot (rounded to nearest whole animal)

² 18,225m² x 0.003 clubshell/m² = 911 rabbitsfoot (rounded to nearest whole animal)

³ 2,366 m² (direct habitat disturbance total – area for the temporary diversion water-filled cofferdam) x 0.050 clubshell/m² x 0.7 (70 % salvage efficiency) = 83 rabbitsfoot (rounded to nearest whole animal)

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of northern riffleshell, clubshell, and rayed bean.

1. Implement project-specific avoidance, minimization, and conservation measures described in the Tier 2 BA (pages 10 to 11, and 15-21) and all Reasonable and Prudent Measures and Terms and Conditions detailed in the PBO and applicable Management Unit 1, Tier 2 actions.
2. Ensure that all contractors are aware of the significant consequences of deviating from full implementation of all measures to avoid and minimize adverse effects, as detailed in the opinion. Of particular importance to contractors are those measures designed to prevent the release of petroleum products, concrete leachates (elevates pH), or other hazardous substances and to ensure the appropriate installation and maintenance of erosion and sediment control measures.
3. Develop a Pollution Prevention Plan which details strict implementation of siltation and erosion measures, off-site storage of toxic materials, contingency plans for unintended catastrophic events, and construction crew education.
4. Flow events that overtop the water-filled diversion or cofferdams may significantly increase the level of take. Therefore, without compromise to human safety or increased risk to property, the federal action agencies (*e.g.*, FHWA and the U.S. Army Corps of Engineers) shall develop a river flow plan that reduces the risk that river high flow events will overtop the construction causeway or demolished bridge during the period that these structures are in the river.
 - a. Provide this plan to the Service for review at least three months prior to the start of any proposed construction activities to ensure that the resulting effects are consistent with those disclosed in the biological assessments and evaluated in this opinion.
 - b. Contractors will monitor weather and river stages, and remove any hazardous materials from the river and the floodplain in the event that flooding is expected.
 - c. Contractors will remove any hazardous materials from the river and the floodplain in the event that flooding is expected.
 - d. In the event of a flow event that overtops the causeway, FHWA and PennDOT will immediately initiate discussions with the Service to evaluate the consequences of the flood and determine if reinitiation of this consultation is required.
 - i. A qualified mussel surveyor shall be available and prepared to initiate a mussel survey comparable to the 2011 effort to evaluate the effect of the flood and re-estimate take.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration, U.S. Army Corps of Engineers, Pennsylvania Department of Transportation, and their contractors, must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. Implement project-specific avoidance, minimization, and conservation measures described in the Tier 2 BA (pp. 15 to 21), and all Reasonable and Prudent measures and terms and conditions detailed in the PBO that are applicable to projects in Management Unit 1.
2. All instream work will be done during low flow conditions.
3. FHWA, PennDOT, or their contractors will develop and implement a plan for treatment of the waste water from the interior of the water-filled cofferdam coffer that contain “green concrete” materials or residue. The plan will be provided to the Service for review and comment to ensure that the risk is consistent with that considered in the biological opinion.
4. As indicted in the Tier 2 BA, FHWA, PennDOT, or their contractor, will monitor pH levels within French creek during and following the concrete pour for a period of up to three days.
 - a. The stream pH shall be continuously monitored during and after the pouring of the concrete at point 50 feet up-and downstream from limit of the project work area within the French Creek main channel and 30 feet downstream from the treatment area within the French Creek western side channel.
 - b. Ambient stream pH readings will be recorded every 20 minutes, 24 hours a day via an automatic, continuous meter.
 - c. pH readings shall be recorded in 15 minute time increments at each sample location via hand held meter to ensure quick identification of pH elevation. Recorded readings shall start not less than 15 minutes prior to the beginning of cement pour each day, and shall end not sooner than pH levels return to less than 7 at the end of each day that cement is placed.
 - d. Operations (pumping of concrete) shall cease if pH levels rise above 8.5 in the monitoring area
 - e. If levels remain at 8.5 for 30 minutes after cessation or begin to decline below 8.5, operations may resume but the rate of pumping shall be reduced to prevent additional rises in pH levels.

- f. If levels continue to rise above 8.5, operations shall remain suspended until pH levels return to 8.5 and either remain at that level for 30 minutes or continue to decline below 8.5.
 - g. If pH levels rise above 9.0 at the sampling location, an inspection of downstream areas extending at least 500 feet shall be performed and any aquatic life changes shall be recorded. If adverse effects are observed, the inspection shall then be extended downstream until occurrences have ceased.
 - h. FHWA, PennDOT, or their contractors, shall immediately notify the Service if any aquatic life “kill” is observed.
 - i. FHWA, PennDOT, or their contractors, will prepare and submit a report detailing the pH levels, in 15 minute time increments at each sample location, and operational adjustments that occur during the project within 30 days of completion of the project.
 - j. FHWA, PennDOT, or their contractor, will maintain at least one (1) backup functional pH meter at the physical work site. Work may not commence on any day there is not a minimum of two (2) functional pH meters on site.
 - k. Stream monitoring will continue up to three hours after the water-filled cofferdams are deflated.
5. FHWA, PennDOT, or their contractor, will maintain a daily written log of weather and river stage (utilizing the U.S. Geological Survey stream gage for the Allegheny River, gage 0302550 – Franklin, PA and French Creek gage 03024000 - Utica, PA), and will immediately stabilize the work area and remove any hazardous materials from the river and the floodplain in the event that flooding is expected.
 - a. The weather and river stage-monitoring log must be made available to the Service upon request and a copy provided to the Service when the project is complete.
 6. If a spill or siltation event does occur in French Creek, all construction must cease until emergency remediation procedures are implemented to contain the spill, and consultation (including a revised biological opinion) is completed.
 7. The Service will be notified immediately of any failures of erosion and sedimentation control measures or spills of hazardous materials.
 8. FHWA, PennDOT, or their contractors, will install and implement a dual filter bag system (one on-line, and one spare on site as a contingency, or two in parallel). The filter bag will be installed on a level area in the site indicated in the Tier 2 BA, and surrounded by a compost filter sock in such a manner that filtered water is allowed to seep back into

the stream in an area that is downstream of the work. A second filter bag system will be installed on the system used to treat water containing green concrete (dependent upon treatment system proposed).

9. All excavated materials from the project will be stored or disposed of in a predetermined, confined, upland site and precluded from re-entry into any aquatic resource. PennDOT, or their contractor will:
 - a. Not affect additional waters of the United States or the Commonwealth by disposing of the project's excavated waste in aquatic resources, including streams, wetlands, riparian areas, and floodways.
 - b. Minimize disturbance to forests, woodlots and trees when selecting and using waste sites.
 - c. Provide the Service with contact information for the contractor responsible for waste sites.
 - d. Install appropriate erosion and sedimentation controls at the disposal site, and stabilize the site using native vegetation.
10. After pier scour protection is completed, contractors will cover the concrete backfill area with natural bed materials (reserved from the excavation) to conform to the surrounding bed elevations. Contractors will expedite all restoration efforts directly after construction to reduce run-off into aquatic areas downstream.
11. FHWA, PennDOT, or their contractor, will develop and implement an appropriate plan for site restoration and removal of the water-filled cofferdams (including silt control measures, rates of water releases, and location of water releases) once the project is complete. The plan shall include measures to minimize additional siltation effects to downstream areas.
12. Project proponents will re-establish riparian areas to avoid post-construction erosion and reduce run-off into French Creek using plant species that are native to the local area.
13. As described in the Tier 2 BA, FHWA, PennDOT, or their contractor, will develop and implement a study to test the effects (lethal or otherwise) of the water-filled cofferdams on resident mussels within the area occupied by the temporary flow filled diversion dam. PennDOT, or their contractor, will submit a study plan to demonstrate on how they intend to conduct this study. The plan will be reviewable by the Service for concurrence and approval. The study area will be excluded from the mussel salvage operation.

14. As described in the Tier 2 BA (Page 10), FHWA, PennDOT, or their contractor, will develop and implement a detailed mussel salvage plan, which will be provided to the Service for approval.
 - a. The salvaged mussels will be relocated to a site in the Elk River, and Queen Shoals, West Virginia.
 - b. The mussel salvage operation will include at least one monitoring event, about three years following the mussel relocation to determine the health and status of the translocated mussels (Tier 2 BA, Page 10).
 - i. FHWA, PennDOT, or their contractor, will provide a monitoring report to the Service documenting the status and health of the relocated mussels.
 - c. FHWA, PennDOT, or their contractor, will provide a report to the Service, describing the results of the mussel salvage effort, and an estimate of take.

Reinitiation Notice

In accordance with our amended December 13, 2013, biological opinion, incidental take that occurs as a result of this and other Bridge Program projects cannot exceed the annual or cumulative incidental take levels established in the programmatic biological opinion. If implementation of any project or projects is anticipated to exceed these take levels, further consultation will be necessary. To ensure that incidental take is not exceeded, annual reports should be provided to this office tabulating the amount of incidental take (as it occurs) on projects being implemented throughout the programmatic action area.

Should new information reveal that the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; or the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or a new species is listed or critical habitat is designated that may be affected by the action; or the amount or extent of take as identified in Table 2 is exceeded, reinitiation of formal consultation as outlined in 50 CFR 402.16 is required.

If rabbitsfoot critical habitat is designated, you may ask the Service to confirm the conference opinion portion of this document as a biological opinion. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned, or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary. After designation of critical habitat and any subsequent adoption of this conference opinion, the Federal Highway Administration shall request reinitiation of consultation if: (1) new information reveals the agency action may affect critical habitat in a manner or to an extent not considered in this conference opinion; or (2) the agency action is subsequently modified in a manner that causes an effect to critical habitat that was not considered in this conference opinion.

Should new information reveal that the agency action may affect listed species in a manner or to an extent not considered in this opinion; or the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or a new species is listed or critical habitat is designated that may be affected by the action; or the amount or extent of take as identified in the above incidental take statement or Appendix A, is exceeded, reinitiation of formal consultation as outlined in 50 CFR 402.16 is required.

If you have any questions regarding this matter, please contact Jennifer Kagel of this office at 814-234-4090.

Sincerely,

Lora Zimmerman
Field Office Supervisor

cc:

PFBC – Urban, Allison
PennDOT – District 1-0 – Kelley
COE – Pittsburgh - Edris
DEP – NWRO – Supel

Literature Cited

- EnviroScience. 2011. Freshwater Mussel Survey of French Creek (Venango County, Pennsylvania) at the Washington Crossing (Route 62) Bridge. Report prepared for PA Department of Transportation – District 1-0. 11 pages plus appendices.
- Federal Highways Administration. 2014. Programmatic Tier II Biological Assessment: Washington Crossing S.R. 0062, B08, Pier 2 and 3 Scour Protection Project Over French Creek, Venango County, Pennsylvania. PA Department of Transportation – District 1-0. 24 pages plus Appendices.
- Federal Highways Administration. 2014. Amendment to the Programmatic Tier II Biological Assessment: Washington Crossing S.R. 0062, B08, Pier 2 and 3 Scour Protection Project Over French Creek, Venango County, Pennsylvania. PA Department of Transportation – District 1-0. Tier 1 Consultation Best Management Practices and Conservation Measures checklist, and Appendix D.
- Smith, T. and Crabtree, D. Freshwater Mussel (Unionidae) and Fish Assemblage Habitat Use and Spatial Distributions in the French Creek Watershed: Reference for Western Pennsylvania Unionid Protection and Restoration. Report Funded by the U.S. Fish and Wildlife Service. 118 pp.
- U.S. Fish and Wildlife Service. 2012. Proposed endangered status for the Neosho mucket, threatened status for the rabbitsfoot, and designation of critical habitat for both species. Federal Register Volume 77, No. 200, pages 63440-63536.

Appendix A

Bridge Program projects by project type and Management Unit (adapted from Appendix C of the BA). Tier 2 incidental take estimates (in parentheses and bold text) verses those considered during the program biological assessment.

County	Project Title	Project Type	MU	Density Estimates (Estimates based upon site specific survey information)				Proposed area of direct riverbed disturbance (M2)	Direct Effect Take Estimate (Estimates based upon site specific survey information)				Project Status
				Northern Riffleshell	Clubshell	Rayed bean	Snuffbox		Northern Riffleshell	Clubshell	Rayed bean	Snuffbox	
Mercer	Carlton Rd Bridge/New Lebanon over French Creek	Replacement	1	1.82 (3.21)	0 (0)	3.35 (2.18)	0.33 (0.08)	432 (533)	786 (1708)	4 (0)	1447 (1160)	143 (43)	Tier 2 consultation 2013
Venango	Washington's Crossing (S.R. 62) over French Creek	Rehabilitation	1	2.03 (#)	0.001 (#)	3.24 (#)	0.16 (#)	425 (2,786)	862 (518)	0 (≤1036)	1376 (≤1036)	68 (≤1036)	Tier 2 consultation 2013
Bridge replacement projects in MU 1 = 2 of 6				Tier 1 Estimated Incidental Take Tier 2 Estimated Incidental Take Potential salvaged Remaining Tier 1 Incidental Take considered					2475 (1708) 854 767	252 (0) Na 253	4381 (1160) 580 3221	648 (43) 21 605	
Mercer	Race Street bridge/Greenville over Lt Shenango River	Replacement	2	0.0 (0)	0.001 (0)	0 (0)	0.080 (0.061)	234 (501+770)	0	0	0	18 (78)	Tier 2 consultation 2013
Allegheny	Hulton Road Bridge over the Allegheny River	Replacement	2	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0)		11 (66)	11 (66)	11 (66)	0 (0)	Tier 2 consultation 2014

Bridge replacement projects in MU 2 = 1 of 10		Tier 1 Estimated Incidental Take	89	126	129	339	
		Tier 2 Estimated Incidental Take	(66)	(66)	(66)	(78)	
		Potential salvaged	0	0	0	15	
		Remaining Tier 2 Incidental Take considered	23	60	63	276	

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DEP – NWRO - Supel

ES file –

Reader's file

Project file

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